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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/079,019	02/19/2002	Heinz Horbaschek	P02,0048	5210

26574 7590 03/31/2003

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EXAMINER

HO, ALLEN C

ART UNIT	PAPER NUMBER
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2882

DATE MAILED: 03/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/079,019

Applicant(s)

HORBASCHEK, HEINZ

Examiner

Allen C. Ho

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 6-14 is/are rejected.
- 7) ☒ Claim(s) 4 and 5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "14" and "8" have both been used to designate an additional detector. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: A UNIVERSAL X-RAY DEVICE HAVING A PIVOTALLY MOUNTED RADIATOR AND A DISPLACEABLY MOUNTED DETECTOR.

Claim Objections

3. Claims 1 and 11 are objected to because of the following informalities: "detector plane" should be replaced by --holder plane--. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-3 and 6-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Watanabe (U. S. Patent No. 6,325,537 B1).

With respect to claims 1 and 2, Watanabe disclosed a universal x-ray device comprising: an x-ray radiator (12); a radiation detector (16) for detecting x-rays emitted by the radiator; a movably suspended holder (14) having a holder plane, wherein the holder is a C-arm; a radiator mount (Fig. 3) for mounting the radiator to the holder so that the radiator is rotatable around at least one axis perpendicular to the holder plane; and a detector mount (20) for mounting the detector to the holder allowing displacement of the detector in the holder plane.

With respect to claim 3, Watanabe disclosed a universal x-ray device as claimed in claim 1, wherein the radiator mount allows the radiator to be rotated by at least 90° away from a line proceeding between the radiator and the detector (Fig. 2).

With respect to claim 6, Watanabe disclosed a universal x-ray device as claimed in claim 1, wherein the detector mount is a swivel arm (20) having a first end to which the detector (16) is rotatably mounted and a second end that is rotatably hinged to an end (the end at left in Fig. 2) of the holder so that the arm is displaceable in the detector plane.

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With respect to claim 7, Watanabe disclosed a universal x-ray device as claimed in claim 1, further comprising a first motor actuator (30) for rotating the radiator, a second motor actuator (56) for displacing the detector, and a third motor actuator (column 6, lines 30-38) for moving the holder.

With respect to claim 8, Watanabe disclosed a universal x-ray device as claimed in claim 7, further comprising: a control unit (Fig. 14) connected to the first motor actuator, the second motor actuator, and the third motor actuator (inherent, for controlling the motor actuator) for controlling respective movements of the holder, the detector, and the radiator to obtain a plurality of individual images for undistorted combination to form a larger, combined image (3D reconstruction).

With respect to claim 9, Watanabe disclosed a universal x-ray device as claimed in claim 8, wherein the radiator has a focus from which the radiation is emitted, and wherein the control unit tilts the radiator and the detector as a unit relative to the focus (column 6, lines 13-21).

6. Claim 10 is rejected under 35 U.S.C. 102(e) as being anticipated by Watanabe (U. S. Patent No. 6,325,537 B1).

With respect to claim 10, Watanabe disclosed a universal x-ray device, wherein the holder (14) is a C-arm having a first end (the end at right in Fig. 2) at which the radiator mount and the radiator (12) are disposed, and a second end (the end at left in Fig. 2) at which the detector mount (20) and the detector (16) are disposed.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe (U. S. Patent No. 6,325,537 B1) in view of Malamud (U. S. Patent No. 6,483,890 B1).

With respect to claim 11, Watanabe disclosed a method for operating an x-ray device comprising the steps of: providing a movably suspended holder (14) having a holder plane; mounting an x-ray radiator (12) to the holder so as to be rotatable (Fig. 3) around at least one axis perpendicular to the holder plane; moving the detector for obtaining a plurality of x-ray images using the radiator and the detector from a plurality of exposure positions on a circular arc around a focus of the radiator (column 6, lines 13-21, constant SID) so that a central ray of an x-ray beam emitted from the radiator is perpendicularly incident on a middle of the detector (Fig. 2).

However, Watanabe did not teach combining images respectively obtained at the exposure positions to obtain a large-format composite x-ray image without distortion.

Malamud taught combining images from different perspectives (55) to form a large-format composite x-ray image (62) without distortion.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine images respectively obtained at the exposure positions to obtain a large-format composite x-ray image of an object, since a large-composite x-ray image formed

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from different perspectives would give a person additional insight on how different parts of the object are interconnected, thus giving the person a deeper understanding of the internal structure of the object.

With respect to claim 12, Watanabe disclosed a method as claimed in claim 11, comprising displacing and aligning the detector (Fig. 2) at the respective exposure positions.

With respect to claim 13, Watanabe disclosed a method as claimed in claim 11, comprising tilting the radiator for aligning the central ray of the x-ray beam to the middle of the detector (Fig. 2).

With respect to claim 14, Watanabe disclosed a method as claimed in claim 11, comprising providing a primary radiation diaphragm (aperture) through which the x-ray beam proceeds, and adjusting (204b) the primary radiation diaphragm to align the central ray of the x-ray beam on the middle of the detector.

Allowable Subject Matter

9. Claims 4 and 5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter:

With respect to claims 4 and 5, although the prior art discloses a radiator mount for mounting a radiator to a holder so that the radiator is rotatable around at least one axis perpendicular to the holder plane, it fails to teach or fairly suggest a radiator mount that allows

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the radiator to be rotated around a second axis disposed in the holder plane, allowing the radiator to be tilted out of the holder plane.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- (1) Milnes (U. S. Patent No. 6,463,121 B1) disclosed an interactive x-ray position and exposure apparatus for forming a large-format composite x-ray images.
- (2) Palm-Plessmann *et al.* (U. S. Patent No. 5,940,470) disclosed a C-arm and a wall bucky.
- (3) Khutoryansky *et al.* (U. S. Patent No. 5,636,259) disclosed a universal x-ray device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (703) 308-6189. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached at (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0530.


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Allen C. Ho
Examiner
Art Unit 2882

ACH
March 21, 2003


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SUPERVISOR
TECHNOLOGY CENTER 2000